UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,172	03/17/2005	Sung Ho Ryu	1751-377	6475

6449 7590 08/08/2007

ROTHWELL, FIGG, ERNST & MANBECK, P.C.
1425 K STREET, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER	
SAIDHA, TEKCHAND	

ART UNIT	PAPER NUMBER
1652	

NOTIFICATION DATE	DELIVERY MODE
08/08/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No.	Applicant(s)	
	10/528,172	RYU ET AL.	
	Examiner	Art Unit	
	Tekchand Saidha	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *6-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/12/05 & 3/17/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. ***Election***

Applicant's election of Group I, claims 1-5, drawn to an isolated polypeptide comprising a first peptide and a second peptide without traverse in reply filed 6/18/07 is acknowledged.

Applicants further elect with traverse (a1) phospholipase D (PLD) from the first peptides and (a2) actin from the second peptides.

Applicants argue that the IPER dated January 12, 2005 (??), found claims 1-13 to be novel after considering the amended claims submitted on November 15, 2004.

MPEP 1875 states that whether or not the question of unity of invention has been raised by the International Searching Authority, it may be considered by the examiner when serving as an authorized officer of the International Preliminary Examining Authority. Thus, the Examiner is not bound by any previous determination made. In addition, 37 C.F.R. 1.484 indicates that the international preliminary examination is a non-binding opinion. Amended claims submitted on November 15, 2004 were considered in the light of the cited art and found to be not novel as explained previously.

Applicants argue that the members of the first peptides are defined in Markush format. According to MPEP, in Markush claims, the requirement of a technical interrelationship and the same or corresponding special technical features as defined in PCT Rule 13.2, must be considered to be met when the alternatives are of a similar nature. See MPEP 1850 at 1800: 97-98. The Markush alternatives of the first peptides are of a similar nature because these are all related to PLD. In addition, since the claims 1-13 are found novel in the IPER, there is a specific

technical feature which should be sufficient to meet the unity of invention requirement with respect to claims 1-5.

The Office also requires Applicants to elect one species from the first peptides and one species from the second peptides in the claims of the elected Group. In response, Applicants elect (a1) phospholipase D (PLD) as species from the first peptides and (a2) actin as species from the second peptides. Claims 1 and 2 read on the elected species.

Applicants' arguments are considered but not found to be persuasive because the Markush alternatives of the first peptides are not of a similar nature because the PLD peptide could be from any source and of any structure. Hence, does not meet the unity of invention requirement.

Applicants further note that the elected species would be the same as the species that would be elected in response to the above second restriction requirement. As explained above in connection with the second restriction requirement, Applicants respectfully submit that the alternatives of the Markush groups, which are subjected to the second restriction requirement, are entitled to be examined together in the instant application. Therefore, Applicants respectfully request the Office withdraw the second restriction requirement in favor of the instant election of species if the Office were to maintain the election of species requirement.

Applicants' arguments are noted, however, each of the combination of the inventions are distinct as claimed. For example, claim 1 of the first invention requires the first isolated peptide complex of group I comprising a 1st peptide (for example PLD) and a second peptide - **actin**; claim 1 of the second invention requires the first isolated peptide complex of group I

comprising a 1st peptide (for example PLD) and a second peptide - **aldolase.**

Claim 1 of the first and the second invention are distinct because claim 1 of the first invention requires the mutually exclusive characteristic of peptide complex which has **actin** which is not encompassed by the second invention; and claim 1 of the second invention requires the mutually exclusive characteristic of peptide complex which has **aldolase,** which is not encompassed by the first invention, and so on.

Therefore, each of the combinations of the peptide complexes are distinct inventions as explained above. The term species for the peptide complexes is referred for convenience. Others reasons of examination and search burden for the lack of Unity of Invention are explained in the prior Office Action. The lack of unity determination is still deemed proper and is therefore made FINAL.

2. **Claims withdrawn**:

Claims 6-13 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. ***Sequence Rules***

The instant specification, Figures 3B (amino acid sequence), Figure 26A and page 35 of the specification (Table 1) - present sequence, or sequence comparison or short sequences, respectively, that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2), but fails to comply with the requirements. According to 37 CFR 1.821-825, every disclosed amino acid sequence of four or more residues or 10 or more nucleotides must be identified by a SEQ ID NO. The amino acid

sequences presented do not have SEQ ID NOs. In order to comply with the sequence rules Applicants must identify these sequences by providing SEQ ID NO:, and where required provide a new version of the sequence listing and disk.

Figure legends may be amended to indicate the appropriate SEQ ID Nos.

Applicant must submit a CRF copy and paper copy of the Sequence Listing, a statement that the content of the paper and computer readable copies are the same and where applicable include no new matter as required by 37 C.F.R. j 1.821(e) or 1.821(9 or 1.821(g) or 1 .825(d), as well as an amendment directing its entry into the specification.

New Sequence Rules

Since the effective filing date after July 1, 1998, Applicants should follow the New Rule Format and submit a new Sequence Listing (both in electronic and paper format). Compliance according to the requirements of 37 CFR 1.821 through 1.825 is required.

4. ***Specification***

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

5. ***Claim Objections***

Claims 1-5 are objected to because of the following informalities: Claims recited non-elected subject matter. Appropriate correction is required to delete the non-elected subject matter from the claims.

6. ***Claim Rejections - 35 USC § 112*** (first paragraph)

Written Description

Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims are directed to a genus of peptide complexes comprising any phospholipase D (PLD) and actin from any source and including variants, fragments and fusion peptides comprising PLD and actin from any source with no defined structure or any assigned function to the variant complex.

The specification does not contain any disclosure or description of the structure and function of all variant complex sequences having a defined function or activity. Further, the specification as filed does not describe specific assays to measure the various polypeptide complexes having the 'PLD-Actin activity' or which is so evident, as none is described. It is also not known what the function of the claimed complexes are? The genus of peptide complexes that comprise these PLD-actin molecules is a large variable genus with the potentiality of comprising different protein PLD-Actin complexes from a variety of phospholipases and actins which may or may not have the desired function. Therefore, many functionally unrelated peptide complexes are encompassed within the scope of these claims.

The specification discloses the PLD-2-binding protein from rat brain obtained using the antibody to the rat PLD-2 (of sequence of SEQ ID No. 8) and the identification of rat brain β-actin (43-kDa protein), detected as a PLD2-binding protein of the claimed genus which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. [Other sequences of SEQ ID NO:

9-15 are disclosed but these sequences are structurally distinct and may or may not detect PLD2-binding protein or activity]. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

7. ***Enablement Rejection***

Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a PLD-2-binding protein from rat brain obtained using the antibody to the rat PLD-2 (of sequence of SEQ ID No. 8) and the identification of rat brain β-actin (43-kDa protein), does not reasonably provide enablement for any peptide complexe(s) comprising any phospholipase D (PLD) and actin from any source and including variants, fragments and fusion peptides comprising PLD and actin from any source with no defined structure or any assigned function to the variant complex. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The scope of the claims does not commensurate with the enablement provided by the disclosure with regard to the extremely large number of peptide complexes broadly encompassed by the claims. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the

proteins' structure relates to its function. However, in this case the disclosure is limited to the detection of rat PLD2-binding protein using rat PLD2 antibody.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications and produce PLD-binding protein complexes comprising PLD and actin from any source, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of the claims which encompass all modifications of PLD or actin polypeptides of varying SEQ ID NO:??, raise antibodies against PLD polypeptides and detect PLD2-binding protein to PLD2-actin protein complexes because the specification does **not** establish: (A) regions of the protein structure which may be modified without effecting PLD2 or actin protein activity; (B) the general tolerance of PLD2 or actin to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any PLD2 or actin residues with an expectation of obtaining the desired enzymatic or biological function capable of catalyzing a defined chemical reaction using known substrates or a PLD against which PLD antibodies can be raised to bind to actin to form a complex; and (D) the specification provides

insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of exact nature of the peptide complexes is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

8. Claims 1-5 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific or substantial asserted utility or **a well established utility**.

Applicants disclose a polypeptide complex between rat-PLD2-antibody and rat β-actin. While the rat-PLD2-antibody is useful in detection of rat β-actin (see example 1), no utility is assigned or is apparent to the complex formed between rat-PLD2-antibody and rat β-actin and therefore the 'isolated peptide complex' comprising a first peptide -PLD, and a second peptide-actin - lack utility.

The specification does not disclose a specific function of the polypeptide complex, its relationship to any disease, or any specific real world use. The specification describes no generic functions for the peptide complex.

It appears that the main utility of the peptide-complex is to carry out further research to identify the biological function and possible diseases associated with said function.

Substantial utility defines a real world use. Utilities that require or constitute carrying out further research to identify or reasonably confirm a real world context of use are not substantial utility. Thus, the claimed invention has no specific or substantial asserted utility.

Claims 1-5 are also rejected for lack of enablement, since claimed sequences were found to lack utility, since enablement requirement of 35 U.S.C. §112 incorporates utility requirement of 35 U.S.C. §101, and since application that fails as matter of fact to satisfy Section 101 also fails as matter of law to enable person of ordinary skill in art to use invention, as required by Section 112.

9. No claim is allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tekchand Saidha whose telephone number is (571) 272 0940. The examiner can normally be reached on 8.30 am - 5.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on (571) 272 0928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tekchand Saidha
Primary Examiner, Art Unit 1652
Recombinant Enzymes, 02A65 Remsen Bld.
400 Dulany Street, Alexandria, VA 22314
Telephone: (571) 272-0940
July 30, 2007